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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/648,643	08/27/2003	Ho-Young Lee	030681-556	3899
21839	7590	11/16/2005	EXAMINER	
BUCHANAN INGERSOLL PC (INCLUDING BURNS, DOANE, SWECKER & MATHIS) POST OFFICE BOX 1404 ALEXANDRIA, VA 22313-1404			HOLTON, STEVEN E	
			ART UNIT	PAPER NUMBER
			2673	

DATE MAILED: 11/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/648,643	Applicant(s) LEE ET AL.	
	Examiner Steven E. Holton	Art Unit 2673	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 August 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5,7,17,18,21,23 and 33-35 is/are rejected.
- 7) ☒ Claim(s) 3,4,6,8-16,19,20,22,24-32 and 36 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 August 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities:
Page 10, line 32, the verb 'suit' should be 'suited' this occurs twice on the line.
Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 7 and 23 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The claims state different calculations that are performed by the pixel transition determiner while in operation. Four such operations are listed in the claim language and the Examiner believes they are intended to correspond to equations 1-4 on page 13 of the specification. The first, third and fourth operations correspond to the respective equations, 1, 3, and 4. However, the second operation described by the claims is: "an average of absolute values of the gray levels of all of the pixels included in the square block except for the current frame pixel" is not the equivalent of equation 2 as shown in the specification. The specification shows an equation that calculates the average variance between the pixels in the block and the center pixel in the block. It is not an average of absolute values except for the current frame pixel, but a measurement of the differences between the surrounding pixel and center pixel of the block. The written disclosure does not teach the methods of calculation currently stated within the claims, but a different set of calculations. Therefore, claims 7 and 23 are rejected under 35 USC 112, 1st paragraph.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 2 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims recite a method of calculating the weights of the subfields and recite the variable, *d*, as part of the calculations of later subfields in the series. However, neither the claims nor the specification define the meaning or define a value for the variable, *d*. As such, the variable is undefined and the claim is indefinite as to the function of the variable, how it might be defined, what might define the variable and any other usages it might possess within the invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 5, 17, 21, and 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi (USPN: 6590616) in view of Kawahara et al. (USPN: 6310588), hereinafter Kawahara, further in view of Kawakami et al. (EP 0973147), hereinafter Kawakami.

Regarding claim 33, Takeuchi discloses an image processor for a plasma display panel including “an image signal input unit, which separates only an analog image signal from an input composite image signal (Fig. 1, element 20; col. 7, lines 38-47)”; “an analog-to-digital converter, which converts the analog image signal to a digital image signal (Fig. 1, element 24; col. 7, lines 48-55)”; and a “display control unit (Fig. 1, elements 32, 34, and 36; col. 7, lines 61-6), which displays the subfield-converted image ... on the PDP”. However, Takeuchi does not expressly disclose “a gamma correction unit, which corrects the digital image signal to suit for the characteristics of a plasma display panel (PDP);

A false contour elimination unit, which converts subfields by changing a gray level of the corrected digital image signal depending on a degree of gray-level transition between each current frame pixel and a corresponding previous frame pixel in the image signal so that false contour is minimized”.

Kawahara discloses an image display apparatus including a gamma correction unit (Fig. 1, element 2; col. 6, lines 20-25) and a display control unit (Fig. 1, element 8; col. 8, lines 8-35). However, Kawahara does not expressly disclose a false contour elimination unit.

Kawakami discloses an image display apparatus including a false contour elimination unit (Fig. 3, elements 3 and 4 combined; paragraph 41). The Examiner notes that the two units of Kawakami are named a motion detection section and a data correction processing section, but the function of the two devices is to analyze the image data and change the data to correct and remove the generation of false contours.

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At the time of invention it would have been obvious for one skilled in the art to combine Takeuchi and Kawahara to produce an image display device. The motivation for adding the gamma correction unit and display driver of Kawahara would be “for correcting the γ characteristic which is added to the original analog image signals assuming that the signals are displayed on a CRT (Kawahara, col. 6, lines 20-23).” As the display of both Takeuchi and Kawahara is used with a PDP correction of the signal would be required to have a reasonable output image.

It would have further been obvious to one skilled in the art to combine the false contour elimination unit of Kawakami to the combination of Takeuchi and Kawahara to produce a device as defined in claim 33. The motivation would have been “to provide moving picture display method and moving picture display apparatus for excellent picture quality which largely restrain the generation of the false contour of a moving picture observed by eyes in a display apparatus which performs a tone display according to a subfield method (Kawakami, paragraph 22).” Thus, it would have been obvious to combine Takeuchi, Kawahara and Kawakami to produce a device as specified in claim 33.

Regarding claim 34, Kawahara discloses an error diffuser circuit to diffuse errors in the gray levels of a pixel to adjacent pixels (Fig. 1, element 4; col. 13, line 43 – col. 14, line 9) and a subfield converter to convert final gray signals to usable subfield pulses to display the image (Fig. 2, element 71; col. 6, lines 39-47). Kawakami discloses a data converter to process the signal to find places within a predetermined range (Fig. 4, element 22-1; page 7, lines 4-10) and a gray-level changing unit that alters the gray

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level based on the current and previous image data (Fig. 4, elements 24-28; paragraphs 44 – 49).

Regarding claim 35, Kawakami discloses a pixel transition determiner (Fig. 4, element 27; paragraph 46) a still image determiner that determines if a motion vector needs to be calculated depending on the motion of the pixels from the previous frame to the current frame (Fig. 4, element 28; Fig. 21; paragraphs 98-99). Kawakami also discloses a pixel group number storage part to store group information about pixels from the previous frame (Fig. 4, element 23-2; paragraph 44) and a second gray-level changing unit to make the final alterations of the gray levels of the signals based on calculations from previous sections (Fig. 4, element 28; Figs. 20-22; paragraphs 72-122). Kawakami discloses a frame memory part that is used to keep information about the previous frame for use in later calculations (Fig. 4, element 20; paragraph 43). The Examiner notes that the memory part of Kawakami is a delay circuit which stores the information inside of a circuit that merely delays the propagation of the signal before transmitting the data to the processing elements; it is also well-known in the art to use an actual memory to store data of a previous image before processing it and such an alteration would be obvious to one skilled in the art. The Examiner notes that the still image determiner does not produce a signal that shows the entire frame from previous to current is a still image, but produces signals referring to the motion/stillness of groups of pixels. In a still image, the flags from this calculation would all be set to indicate no motion and therefore, would act as signaling that the entire image was still from the previous frame to the current frame.

Regarding claims 1 and 17, these claims are drawn to an apparatus and associated method of operation. The limitations of independent claim 1 are the same as the limitations of claim 34, but lack the inherited limitations of claim 33. Therefore, the combination of Takeuchi, Kawahara and Kawakami disclose all of the limitations of claim 1 and the apparatus would further possess a method of operation such as in claim 17.

Regarding claims 5 and 21, these claims are drawn to an apparatus and associated method of operation. The limitations of claim 5 are the same as the limitations of claim 35, but lack the inherited limitations of claim 33. Therefore, the combination of Takeuchi, Kawahara, and Kawakami disclose all of the limitations of claim 5 and the apparatus would further possess a method of operation such as in claim 21.

Allowable Subject Matter

7. Claims 3, 4, 6, 8-16, 19, 20, 22, 24-32, and 36 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hsu et al. (USPN: 6774873) discusses a method of error diffusion utilizing rations of pixel diffusion that are the same as those discussed within the specification.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven E. Holton whose telephone number is (571) 272-7903. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on (571) 272-7681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Steven E. Holton
November 11, 2005
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**VIJAY SHANKAR
PRIMARY EXAMINER**